Electronic Version

Stylesheet Version v1.1.1

Claims

[c1] What is claimed is:

1.A display panel comprising:

a silicon substrate with a pixel area located in a surface of the silicon substrate;

a micro color filter disposed on the pixel area on the silicon substrate;

a liquid crystal layer disposed on the micro color filter;

a top alignment layer positioned on the liquid crystal layer; and

a transparent conductive layer disposed on the top alignment layer;

wherein when light enters into the display panel, only a specific spectrum of light is permitted to transmit through the micro color filter and is then reflected upward by the silicon substrate to form images.

[c2] 2.The display panel of claim 1 wherein the display panel further comprises a bottom alignment layer disposed between the liquid crystal layer and the micro color filter.

[c3] 3.The display panel of claim 1 wherein the display panel further comprises a bottom alignment layer disposed between the silicon substrate and the micro color filter.

[c4] 4.The display panel of claim 1 wherein the display panel further comprises a driving circuit disposed on the surface of the silicon substrate, the driving circuit comprising a plurality of metal electrodes to reflect incident light through the micro color filter upward to form images.

[c5] 5.The display panel of claim 1 wherein the micro color filter is composed of a plurality of stacked optical thin films, and comprises a low index optical thin film stack or a high index optical thin film stack.

[c6] 6.The display panel of claim 5 wherein the low index optical thin film stack comprises a silicon oxide (SiO_2) layer.

[c7] 7.The display panel of claim 5 wherein the high index optical thin film comprises a titanium oxide (TiO_2) layer or a tantalum oxide (Ta_2O_5) layer.

[c8] 8.The display panel of claim 1 wherein the liquid crystal layer comprises liquid molecules aligned in a homeotropic type or a twist nematic type.

[c9] 9.The display panel of claim 1 wherein a thickness of the liquid crystal layer is about 0.5 to 10 microns.

[c10] 10.A display panel comprising:
a silicon substrate with a first pixel area, a second pixel area, and a third pixel area defined in a surface of the

silicon substrate;

a first micro color filter, a second micro color filter, and a third micro color filter respectively disposed in the first pixel area, the second pixel area, and the third pixel area on the surface of the silicon substrate;

a bottom alignment layer disposed on the first micro color filter, the second micro color filter, and the third micro color filter;

a liquid crystal layer disposed on the bottom alignment layer;

a top alignment layer disposed on the liquid crystal layer; and

a transparent conductive layer disposed on the top alignment layer;

wherein when light enters the display panel, lights of a first specific spectrum, a second specific spectrum, and a third specific spectrum are reflected from the first pixel area, the second pixel area, and the third pixel area respectively.

[c11] 11.The display panel of claim 10 wherein the display panel further comprises a driving circuit disposed on a surface of the silicon substrate to drive the substrate and reflect light transmitting through the first micro color filter, the second micro color filter, and the third micro color filter upward to form images.

[c12] 12.The display panel of claim 10 wherein light of the first specific spectrum, the second specific spectrum, and the third specific spectrum are red, blue, and green light respectively.

[c13] 13.The display panel of claim 10 wherein each of the first micro color filter, the second micro color filter, and the third micro color filter is composed of a plurality of stacked optical thin films, and comprises a low index optical thin film stack or a high index optical thin film stack.

[c14] 14.The display panel of claim 13 wherein the low index optical thin film stack comprises a silicon oxide (SiO_2) layer.

[c15] 15.The display panel of claim 13 wherein the high index optical thin film comprises a titanium oxide (TiO_2) layer or a tantalum oxide (Ta_2O_5) layer.

[c16] 16.The display panel of claim 10 wherein the liquid crystal layer comprises liquid molecules aligned in a homeotropic type or a twist nematic type.

[c17] 17.The display panel of claim 10 wherein a thickness of the liquid crystal layer is about 0.5 to 10 microns.

[c18] 18.The display panel of claim 10 wherein the display

panel further comprises a cooling system on the silicon substrate.